

Practical 11

Routing at Network Layer

AIM:- a)Simulate Static Routing Configuration using CISCO Packet Tracer

Procedure:

1. Create the Network Topology
 - Place three routers (Router0, Router1, Router2) and connect them serially.
 - Connect PCs to each router for testing.
 - Assign IP addresses to each interface as per the given network table.
2. Configure Router0
- 3.
4. Router>enable
5. Router#configure terminalRouter(config)#ip route 30.0.0.0 255.0.0.0 20.0.0.2
10Router(config)#ip route 30.0.0.0 255.0.0.0 40.0.0.2 20Router(config)#ip route 30.0.0.100
255.255.255.255 40.0.0.2 10Router(config)#ip route 30.0.0.100 255.255.255.255 20.0.0.2
20Router(config)#ip route 50.0.0.0 255.0.0.0 40.0.0.2 10Router(config)#ip route 50.0.0.0
255.0.0.0 20.0.0.2 20Router(config)#exit
6. Router#show ip route static
7. Configure Router1
- 8.
9. Router>enable
10. Router#configure terminalRouter(config)#ip route 10.0.0.0 255.0.0.0 20.0.0.1
10Router(config)#ip route 10.0.0.0 255.0.0.0 50.0.0.1 20Router(config)#ip route 40.0.0.0
255.0.0.0 20.0.0.1 10Router(config)#ip route 40.0.0.0 255.0.0.0 50.0.0.1 20
11. Router#show ip route static
12. Configure Router2
- 13.
14. Router>enable
15. Router#configure terminalRouter(config)#ip route 10.0.0.0 255.0.0.0
40.0.0.1Router(config)#ip route 30.0.0.0 255.0.0.0 50.0.0.2
16. Router#show ip route static
17. Verification
 - On Router0, check routes using show ip route static.
 - Ping from PC in network 10.0.0.0/8 to PC in 30.0.0.0/8.
 - Use tracert to observe the path taken.
 - Delete main route and test backup route activation.

```

Router0
Physical Config CLI Attributes
IOS Command Line Interface

Router>enable
Router#show ip route static
  30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
S    30.0.0.0/8 [10/0] via 20.0.0.2
S    30.0.0.100/32 [10/0] via 40.0.0.2 The main route
S    50.0.0.0/8 [10/0] via 40.0.0.2 that we want to delete.

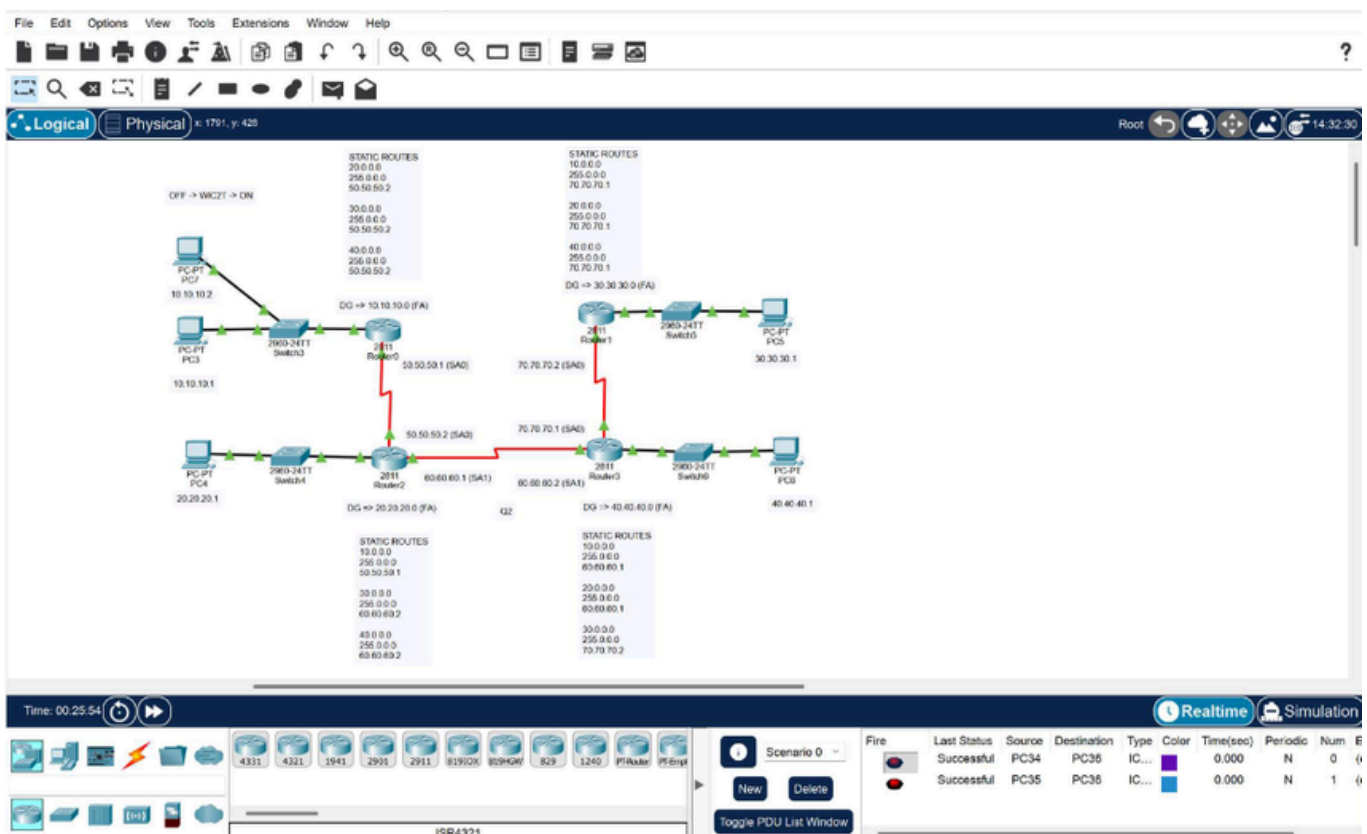
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip route 30.0.0.100 255.255.255.255 40.0.0.2
Router(config)#exit Deleting the main route
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#show ip route static
  30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
S    30.0.0.0/8 [10/0] via 20.0.0.2
S    30.0.0.100/32 [20/0] via 20.0.0.2 As soon as we remove the
S    50.0.0.0/8 [10/0] via 40.0.0.2 main route, the router changes
the backup route to the main route.

Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip route 30.0.0.100 255.255.255.255 20.0.0.2
Router(config)#exit Deleting the new main route
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#show ip route static
S    30.0.0.0/8 [10/0] via 20.0.0.2
S    50.0.0.0/8 [10/0] via 40.0.0.2
Router#

```



Result:

Static routing was successfully configured. Routers used the main route for communication, and the backup route was activated automatically when the main route failed.

AIM:- b)Simulate RIP using CISCO Packet Tracer

Procedure:

Create the Network Topology

Add three routers (Router0, Router1, Router2) and two PCs.

Connect routers using Serial interfaces and PCs using FastEthernet.

Use the following IP configuration:

Device Interface IP Address Connected To

PC0 Fa0 10.0.0.2/8 Router0 Fa0/1

Router0 Fa0/1 10.0.0.1/8 PC0

Router0 S0/0/0 192.168.1.249/30 Router1 S0/0/0

Router0 S0/0/1 192.168.1.254/30 Router2 S0/0/1

Router1 S0/0/0 192.168.1.250/30 Router0 S0/0/0

Router1 S0/0/1 192.168.1.246/30 Router2 S0/0/0

Router2 S0/0/0 192.168.1.245/30 Router1 S0/0/1

Router2 S0/0/1 192.168.1.253/30 Router0 S0/0/1

Router2 Fa0/1 20.0.0.1/8 PC1

PC1 Fa0 20.0.0.2/8 Router2 Fa0/1

Assign IP Addresses and Enable Interfaces

Example for Router0:

Router>enable

Router#configure terminal

Router(config)#interface fa0/1

Router(config-if)#ip address 10.0.0.1 255.0.0.0

Router(config-if)#no shutdown

Router(config)#interface s0/0/0

Router(config-if)#ip address 192.168.1.249 255.255.255.252

Router(config-if)#clock rate 64000

Router(config-if)#no shutdown

Router(config)#interface s0/0/1

Router(config-if)#ip address 192.168.1.254 255.255.255.252

Router(config-if)#no shutdown

Router(config)#exit

(

Repeat for Router1 and Router2 with corresponding IPs.)

Enable RIP Routing Protocol

Router0:

```
Router(config)#router rip
```

```
Router(config-router)#network 10.0.0.0
```

```
Router(config-router)#network 192.168.1.248
```

```
Router(config-router)#network 192.168.1.252
```

Router1:

```
Router(config)#router rip
```

```
Router(config-router)#network 192.168.1.244
```

```
Router(config-router)#network 192.168.1.248
```

Router2:

```
Router(config)#router rip
```

```
Router(config-router)#network 20.0.0.0
```

```
Router(config-router)#network 192.168.1.244
```

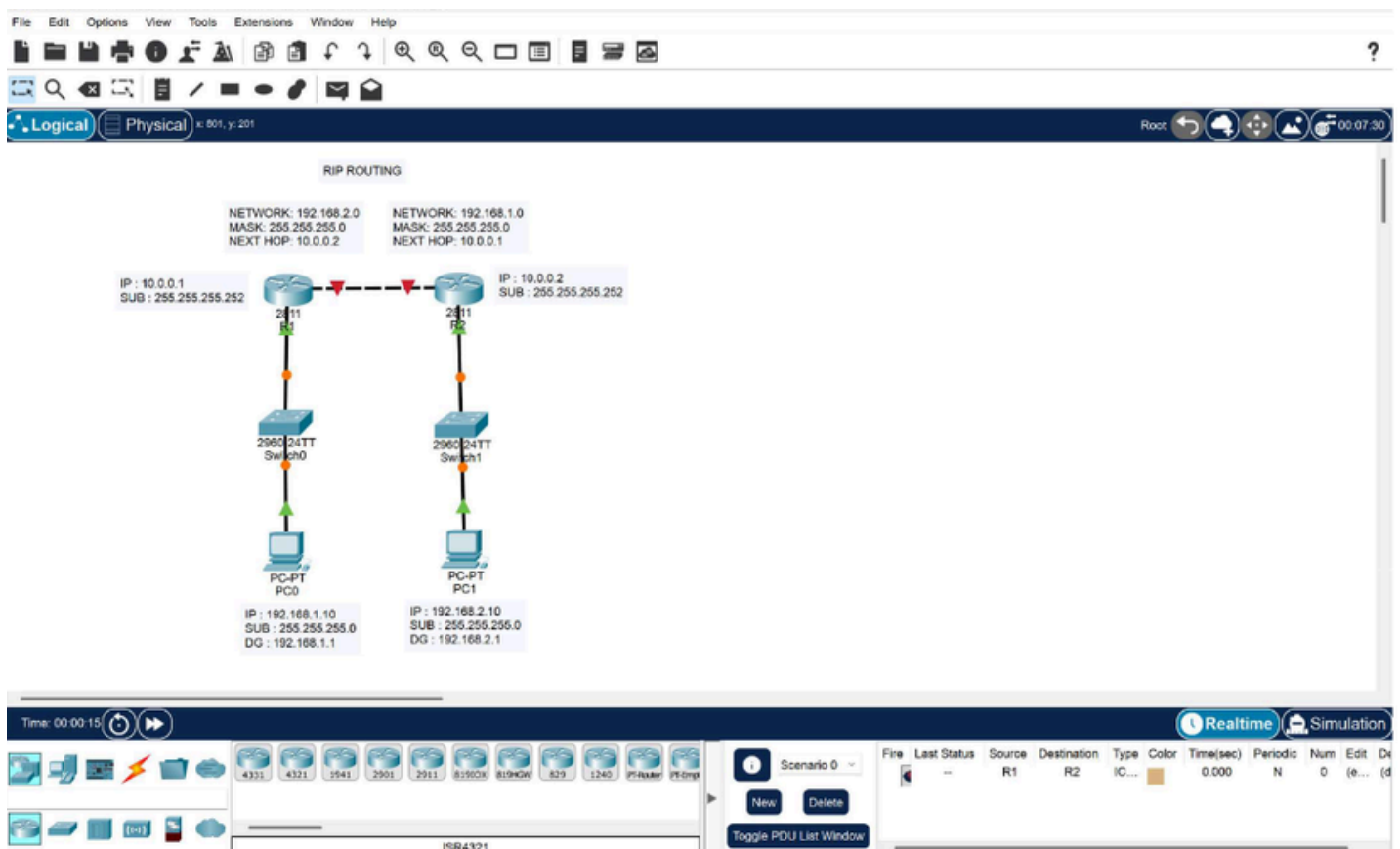
```
Router(config-router)#network 192.168.1.252
```

Verification

Use show ip route to view learned routes.

Ping from PC0 (10.0.0.2) to PC1 (20.0.0.2) to verify connectivity.

Successful replies confirm correct RIP configuration.



RESULT:

RIP protocol was successfully configured on all routers. The routers dynamically exchanged routing information, enabling communication between all networks without manual static entries.